Bhoj Reddy Engineering College for Women: Hyderabad

Department of Physics

Lesson plan of faculty member for the academic year 2019–20

Class: I B Tech Branch: IT-A Semester: II

Subject: Applied Physics Lectures per week: 3 + 1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
UNIT – I: Quantum Mechanics		
1	Introduction to quantum physics	16 January 2020
2	**Tutorial:** Black body radiation, Planck's law	17 January 2020
3	Photoelectric effect, Compton effect	20 January 2020
4	de-Broglie's hypothesis, Wave-particle duality	22 January 2020
5	Davisson and Germer experiment, Heisenberg's Uncertainty principle	23 January 2020
6	**Tutorial:** Problems	24 January 2020
7	Born's interpretation of the wave function, Schrodinger's time independent wave equation	27 January 2020
8	Particle in one dimensional box	29 January 2020
UNIT-II: Semiconductor Physics		
9	Introduction to Intrinsic semiconductors	30 January 2020
10	**Tutorial:** Extrinsic semiconductors	31 January 2020
11	Dependence of Fermi level on carrier-concentration and temperature	03 February 2020
12	Carrier generation and recombination, Carrier transport: diffusion and drift	05 February 2020
13	Hall effect	06 February 2020
14	**Tutorial:** Discussion of Objective questions	07 February 2020
15	p-n junction diode	10 February 2020
16	Zener diode and their V-I Characteristics,	12 February 2020
17	Bipolar Junction Transistor (BJT): Construction, Principle of operation	13 February 2020
18	**Tutorial:** Problems	14 February 2020
UNIT-III: Optoelectronics		
19	Radiative and non-radiative recombination mechanisms in semiconductors	17 February 2020
20	Discussion of Objective questions	19 February 2020
21	LED	20 February 2020
22	semiconductor lasers: Device structure, Materials, Characteristics and figures of merit	24 February 2020
23	Semiconductor photodetectors: Solar cell	26 February 2020
24	Problems	27 February 2020
25	**Tutorial:** PIN their structure Materials	28 February 2020
26	PIN working principle and Characteristics	02 March 2020
27	Avalanche working principle and Characteristics and their structure Materials	04 March 2020
28	Discussion of Objective questions	11 March 2020
UNIT-IV: Lasers and Fibre Optics		
29	Lasers: Introduction to interaction of radiation with matter, Coherence, Principle and working of Laser	12 March 2020

30	**Tutorial:** Einsteins coefficients	13 March 2020
31	Population inversion, Pumping	16 March 2020
32	Types of Lasers: Ruby laser	18 March 2020
33	Carbon dioxide (CO2) laser	19 March 2020
34	**Tutorial:** Problems	20 March 2020
35	He-Ne laser	23 March 2020
36	Applications of laser	26 March 2020
37	**Tutorial:** Problems	27 March 2020
38	Fibre Optics: Introduction, Optical fibre as a dielectric wave guide, Total internal reflection	30 March 2020
39	Acceptance angle, Acceptance cone	01 April 2020
40	**Tutorial:** Problems	03 April 2020
41	Numerical aperture, Step and Graded index fibres	06 April 2020
42	Losses associated with optical fibres, Applications of optical fibres	08 April 2020
UNIT-V: Electromagnetism and Magnetic Properties of Materials		
43	Laws of electrostatics, Electric current and the continuity equation	09 April 2020
44	Ampere's and Faraday's laws, Maxwell's equations, Polarisation, Permittivity and Dielectric constant	13 April 2020
45	Problems	15 April 2020
46	Internal fields in a solid	16 April 2020
47	**Tutorial:** Clausius-Mossotti equation	17 April 2020
48	Ferroelectrics and Piezoelectrics	20 April 2020
49	Magnetisation, permeability and susceptibility, Classification of magnetic materials,	22 April 2020
50	Ferromagnetism and ferromagnetic domains	23 April 2020
51	**Tutorial:** Discussion of Objective questions	24 April 2020
52	Hysteresis	27 April 2020
53	Applications of magnetic materials	29 April 2020
54	Revision	30 April 2020
55	**Tutorial:**Revision	01 May 2020

Text books

1. Engineering Physics, B.K. Pandey, S. Chaturvedi - Cengage Learing.
2. Halliday and Resnick, Physics - Wiley.
3. A textbook of Engineering Physics, Dr. M.N.Avadhanulu, Dr. P.G. Kshirsagar - S. Chand

REFERENCES:

1. Richard Robinett, Quantum Mechanics
2. J. Singh, Semiconductor Optoelectronics: Physics and Technology, Mc Graw-Hill inc. (1995).
3. Online Course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Guptha onNPTEL

Name and signature of the faculty: G Vijayalaxmi

Name and signature of Head- Physics Faculty : G Vijayalaxmi